

National Aeronautics and Space Administration



goddardview

Volume 7 Issue 9

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## Hundreds Attend Annual IRAD Poster Session

Goddard's emerging technologies were on display at the annual "IRAD Poster Session" Dec. 1 in the Building 8 auditorium. The event, which attracted hundreds of visitors, celebrated the technology advances made by principal investigators who received support under the FY11 Internal Research and Development (IRAD) program. Visitors, principal investigators, and managers praised the event for its high-caliber content.

Sponsored by Goddard's Office of the Chief Technologist, the session provided the venue for revealing the identity of the FY11 "IRAD Innovator of the Year," which this year went to Keith Gendreau, Zaven Arzoumanian, and their NICER/SEXTANT team. ■



Photo credit: NASA/Goddard/Pat Izzo

*Caption:* Hundred fill the Building 8 auditorium for the IRAD Poaster Session.



Photo credit: NASA/Goddard/Pat Izzo

*Caption:* Zaven Arzoumanian and Keith Gendreau receive the 2011 IRAD Innovator of the Year award from Chief Technologist Peter Hughes (far left) and Goddard Deputy Director for Science and Technology Christyl Johnson (far right).

## GoddardView

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On the cover: Artis Weaver (Code 240) fills a package bound for deployed U.S. troops as part of Operation Give Thanks, an initiative of the Veterans Advisory Council.

Photo credit: NASA/Goddard/Bill Hrybyk

### GoddardView Info

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**Deadlines:** News items for publication in the Goddard View must be received by noon of the 1<sup>st</sup> and 3<sup>rd</sup> Thursday of the month. You may submit contributions to the editor via e-mail at [john.m.putman@nasa.gov](mailto:john.m.putman@nasa.gov). Ideas for new stories are welcome but will be published as space allows. All submissions are subject to editing.



## Goddard's Newest Committee Dedicated to Serving

By Dewayne Washington

December 7, 2011, during Pearl Harbor Day, a day forever etched in American history, members of Goddard's newest advisory committee executed 'Operation Give Thanks'. It was the Veterans Advisory Committee's (VAC) first outreach effort, an opportunity for Goddard to show thanks to those who continue to defend the American liberties we all enjoy.

More than 90 boxes were hand packed with items that deployed active duty service members will find most useful in a combat zone. "I was very impressed with what we were able to accomplish," says Madison Townley, co-chair of VAC and Chief of Protective Services at Goddard. "The outpouring of employee donations and support from every Directorate, to include assistance with the packing, was amazing."

A band of veterans with a desire to support one another, as well as enlighten others about the legacy of veteran service, created Goddard's newest committee. "Served and serving is our motto because of our united camaraderie and love of country," says Townley, a former active duty Marine. "It is our desire to serve the Goddard community as best we can."

Approval for Goddard's VAC was signed in October 2010 as a result of increasing interest from veterans and non-veterans alike. At the beginning of this year, Townley was elected co-chair for Greenbelt and Sophie Parker, former active duty Air Force, was elected for Wallops. Adrian Gardner, former active duty Air Force, was chosen by the committee to be their Executive Senior champion.

"We work hard at being a great place to work," said Goddard Center Director Rob Strain, "and our advisory committees play an important role in helping to create and sustain that kind of diverse and inclusive environment. I'm delighted that a veterans committee has been established. Our Nation owes so much to our veterans, so it's enormously gratifying to see this group of employees dedicate themselves to advocating for and supporting the needs and challenges of our veterans community."

'Operation Give Thanks' was the third major activity for the committee since inception. VAC sponsored the participation of an active duty Color Guard unit during Goddard's Martin Luther King Jr. program in January 2011. An active duty unit was also present in May for the committee's first organized program. The Memorial Day remembrance honored service members who have made the ultimate sacrifice for our Country. "This is another aspect of our efforts," says Townley, "to provide the Goddard community an up-close and personal engagement of our active duty members whenever possible."

In November, the committee sponsored a grand celebration for Veterans Day. The program recognized all branches of the Armed Forces and provided an opportunity for Goddard community members to honor veterans they know. "For the freedom they fought for and we now enjoy, and the sacrifices they made, it was a great opportunity to honor all veterans," said Adrian Gardner, Goddard Chief Information Officer.



Photo credit: NASA Goddard/Bill Hrybyk

*Caption: Volunteers help pack boxes for deployed troops during "Operation Give Thanks."*

The committee has also made a special effort to engage veterans from other Goddard locations including the Wallops Facility. "The unique skill set veterans bring is an asset to any employer and watching this group grow within NASA has been a rewarding experience," says Sophie Parker, Wallops Range and Mission Management Office. "The joint VAC at Greenbelt and Wallops allows us to reach out to current and future NASA veterans, helping us create a cohesive vision for our Goddard future. We hope to one day see the VAC represented at every NASA location."

Members of VAC recently assisted Goddard's outreach efforts to our wounded warriors. For Goddard's annual National Air and Space Museum (NASM) event in September, VAC members welcomed a group of recovering active duty military members and their families. The service members had an opportunity to engage members of the NASA community while dining on non-hospital food. "It was an inspiring evening for all," says Townley. The service members also had the unique opportunity to meet retired former Marine General and current NASA Administrator, Charlie Bolden, as well as Goddard's Center Director.

"Not everybody has the desire or opportunity to serve in the military," says Steve Brill, Air Force veteran during the Vietnam War. "Those of us who have, or who are, have a common bond to serve our Country and that bond does not stop when we return to civilian life. We were, and are, all committed to making the ultimate sacrifice if called upon in defense of our great Nation. 'Operation Give Thanks' has been a great opportunity to express the holiday spirit to the men and women of our Armed Forces who truly deserve this Country's highest respect for what they do every day."

The specialty care packages of 'Operation Give Thanks' have left Goddard and are now airborne. VAC members say they hope these small tokens of appreciation serve as acknowledgement to our troops that they are in our hearts and minds during this holiday season. The spirit and esprit de corps of this effort has veteran and non-veteran Goddard members planning for a larger operation next year. ■

## STEREO Mission Celebrates Five Incredible Years of Science

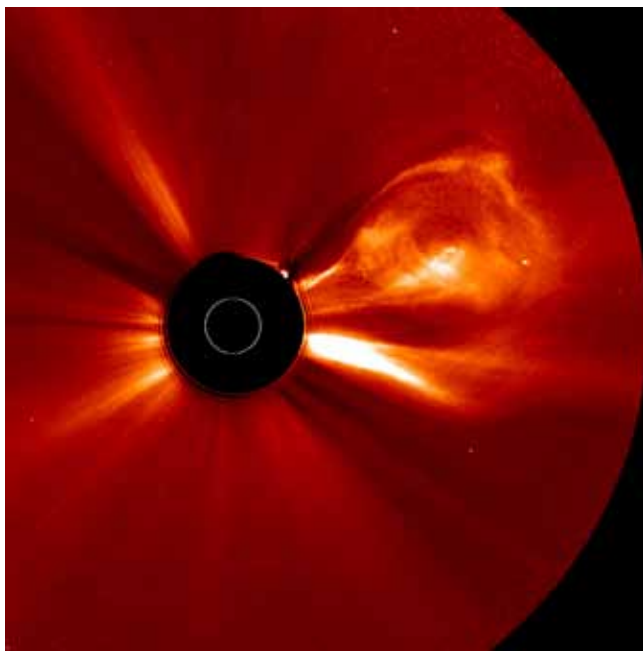
By Karen Fox

On October 25, 2006, a Delta II rocket launched from Cape Canaveral carrying two nearly identical spacecraft. Each satellite was one half of a mission called the *Solar Terrestrial Relations Observatory* (STEREO) and they were destined to do something never done before—see the entire Sun simultaneously.

The Sun rotates, of course, so there's no part of the Sun we haven't at some point observed from our vantage point on Earth. But watching this massive, highly active star from only a single line of sight has its limitations. For one, we never know what's about to come over the horizon: a clear, relatively quiet surface or a cluster of active areas ready to send billions of tons of energy and radiation toward Earth? It's also not easy to gauge the speed, size, or other characteristics of incoming solar activity when only viewing it head on.

"Over the last five years, each STEREO spacecraft has moved to a position in its orbit where it can capture side-view images of anything the Sun sends our way," says Joe Gurman, STEREO's Project Scientist at Goddard. "That's helped us come up with many new answers to old questions about solar activity."

Such solar activity usually comes in the form of bursts of radiation called solar flares or eruptions of solar material and magnetic fields called coronal mass ejections (CMEs). Scientists want to know more about this activity since it can affect our own magnetic environment, interfering with communications and Global Positioning System satellites among other things.



*Caption: STEREO has captured many images of solar material bursting off the Sun, such as this coronal mass ejection (CME) from May 20, 2011.*

To get its unique view of flares and CMEs, the two STEREO spacecraft were launched into a clever orbit scheme. STEREO-A flies in an orbit around the Sun that is somewhat smaller, and therefore faster, than that of Earth. STEREO-B's orbit is somewhat larger and slower. Over time, the difference in the speeds of the orbits have naturally caused STEREO A to move ahead of Earth in its path, and STEREO-B to fall behind. As of February 6, 2011 the two spacecraft reached almost exact opposite sides of the Sun.

"The most important part of this configuration," says Therese Kucera, STEREO's Deputy Project Scientist at Goddard, "is not only does STEREO track CMEs visually from the Sun to Earth, but that information can be combined with data from several other spacecraft sitting right in the line of the solar activity."

Coordinating such in situ observations with an outside perspective opened the door to some of the first movies tracking CMEs and less well-known phenomena such as "co-rotating interaction regions" within the solar wind all the way from the Sun's surface to Earth's environs. STEREO also showed us that bursts of solar energetic particles—of interest because just one particle can knock out computer components in a satellite or harm the DNA of a human in space were much broader than previously thought, extending widely enough that both of STEREO's spacecraft could sense them passing by.

Another crucial aspect of this unique 360-degree view of the Sun is that we can now observe CMEs heading in any direction in space. Such space weather can affect any of NASA's spacecraft, so those who handle flight operations appreciate advance warning before a burst of solar particles pass by their sensitive electronics systems.

STEREO's wide view also helped comet watchers as it recorded the tail of Comet Encke get ripped off by a solar eruption in April of 2007. And STEREO's images of Comet McNaught—one of the brightest comets in 40 years—helped show that the tail contained iron.

In the coming months, the two satellites will keep moving further away from Earth, lining up on the far side of the Sun in 2015 and continuing on their journey until they are once again on Earth's side. During the trip, scientists will use STEREO observations to calibrate their techniques to monitor what's happening on the far side of the Sun by tracking the sound waves that roll through the Sun's interior a technique called helioseismology.

"STEREO was designed to understand what causes CMEs and how they travel, as well as to understand the structure of the solar wind. It's already made great strides in doing that," says Gurman. "I'm looking forward to the next five years." ■

Photo credit: NASA/STEREO

## Two NASA Goddard Engineers Receive Prestigious Award

By Lori Keesey and Edward Campion

Two leading space and engineering organizations recently honored two NASA engineers with achievement awards.

Physicist and electrical engineer Diane Elizabeth (Betsy) Pugel, who works at the Detector Systems Branch at Goddard, received the Women in Aerospace's Achievement Award (WIA) at the organization's 26th Annual WIA Awards Dinner and Ceremony on Nov. 1. Among other criteria, WIA bestows this award on individuals who have demonstrated noteworthy, proven, technical, or scientific achievement on a single aerospace project or program that represents a breakthrough or milestone in the aerospace field.



*Caption: Diane Betsy Pugel.*

Pugel received the honor because of her work implementing new technologies and cutting-edge approaches to test candidate materials for the thermal-protection system on NASA's Orion crew exploration vehicle. The thermal-protection system was developed to protect the conical-shaped crew module from friction-induced heat as it hurtled through Earth's atmosphere during reentry.

The approach she used to test materials was innovatively applied to take spectroscopic measurements and ultraviolet images of resin-based composites and oxides to evaluate their degree of cure, variations, and defects. Unlike other testing methods, the approach was non-destructive, portable, and could be used in field tests. In addition to her work on Orion, Pugel also advanced large-scale computed tomography and metal-composite bond analyses for the Federal Aviation Administration.



*Caption: Steven Scott.*

Also recently honored is Goddard Chief Engineer Steven Scott. The American Institute of Aeronautics and Astronautics (AIAA) named Scott one of its 184 new Associate Fellows in the 2012 class. To be selected, individuals must have at least 12 years of professional experience and a recommendation from at least three current Associate Fellows. He will be honored at the organization's Associate Fellows Dinner on Jan. 9, 2012 in conjunction with the 50th AIAA Aerospace Sciences Meeting in Nashville, Tenn.

Pugel, a Michigan native, is an avid soccer player and cellist, and enjoys tinkering with bicycles. Scott was born in Easton, Penn. He enjoys music, skiing, and walking his dog.

For more information about the Women in Aerospace's Achievement Award, visit: <http://women.nasa.gov/wiaa>.

For more information about the AIAA, visit: <http://www.aiaa.org>.

For an article featuring Diane Betsy Pugel in Tech Transfer magazine, visit: [http://ipp.gsfc.nasa.gov/newsletter/winter\\_08.htm](http://ipp.gsfc.nasa.gov/newsletter/winter_08.htm). ■

## Stories of Missions Past: Explorers

By Karen Fox

On September 29, 2011, NASA announced the short list for five potential new "Explorer class" spacecraft. These missions are by definition small and relatively inexpensive, designed to be led by a small team.

The Explorer class missions are numbered at 92 so far, with more constantly planned. Explorer class spacecraft recorded the signature left over from the Big Bang. They mapped out the complex geometry of Earth's magnetic environment. They found gamma rays coming from everywhere in the sky. They help warn scientists of incoming radiation from solar flares.

"The neat thing about the Explorers is that they're tailored to a specific problem," says Wilt Sanders, the Program Scientist for the Explorer's Program. "That's their strength. They're relatively inexpensive but they've come up with game changing results."

And it all began over five decades ago.

### The First Explorer

It was January 31, 1958 and a Juno 1 rocket was almost ready to launch. It carried precious cargo -- a satellite called *Explorer 1*, that everyone hoped would be the first U.S. satellite in space. The mood among those at Cape Canaveral Air Force Station, Fla. was tense. Not only had the Soviets already successfully launched Sputnik into space, but three months earlier, a rocket attempting to launch a U.S. satellite had flown a mere four feet before tumbling back to the ground.

The familiar countdown began: "10 . . . 9 . . . 8 . . ." and at 10:48 p.m. EDT, the Juno shot up, climbed over 200 miles into the sky, and released *Explorer 1* into space. It wasn't until some two hours later, when the satellite had made its first complete orbit of Earth and was in close enough range to send a signal that it was operational, that the observers rejoiced. The very first U.S. satellite was officially a success.



Caption: The first U.S. satellite in space, Explorer I was more than just a triumph of engineering; it was filled with scientific instruments to collect data on space.

For many, the tale of *Explorer 1* stops here, a triumph of human ingenuity in reaching space. But that's only the beginning of the story. "*Explorer 1* was also a science mission," says Willis Jenkins, the program executive for NASA's Explorer program. "This wasn't just launched to get a satellite up in space, it was meant to bring science data back."

And it certainly did. *Explorer 1* contained experiments that turned our understanding of space upside down. To this day, scientists try to understand the dynamic, seething environment encircling Earth—known as the Van Allen radiation belts—that *Explorer 1* helped discover.

### Space Science Begins . . .

*Explorer 1* was also, of course, the first in a long line of scientific work-horses. Some of the latest Explorers have names that are well known in the scientific community: the *Swift Gamma Ray Burst Explorer* (Swift) and the *Cosmic Background Explorer* (COBE). The last one brought home data that earned a Nobel Prize. But the early Explorers were simply named with numbers, and it is these that are some of the unsung heroes of space exploration—making new discoveries that scientist today take for granted.

*Explorer 1* and *Explorer 3*, for example, launched in January and March of 1958, respectively. They carried an instrument built by the University of Iowa scientist James Van Allen that could detect energetic particles in space. This instrument was quite simply a single Geiger counter attached to a miniature tape recorder. As the satellites climbed upwards, the rates of the particles usually increased but, periodically, they zeroed out completely. Van Allen and his team realized this was neither because the particles disappeared nor because the instruments failed, but because the radiation counts were so high that the sensors overloaded. From this, Van Allen deduced that a swath of intensely energetic particles was trapped in a circle around Earth. Ultimately, two such belts were found, and they're now known as the Van Allen Radiation Belts.

Not all was easy on those early missions. Neither *Explorer 2* nor *Explorer 5* even made it into orbit, due to launch rocket failure. While such losses were devastating, the amount of time going into building these early, simpler satellites was nothing like the years it takes today. All five of the first Explorers were launched within the first six months of 1958.

By the time of *Explorer 10* in 1961, the Explorer Program was now run by the newly founded NASA. They'd also earned the right to have names as well as numbers, albeit modest ones: *Explorer 10* was also known as *P 14*. It gathered data for only 52 hours since its goal was merely to fly up out of Earth's magnetic environment and bring back information from interplanetary space on the other side. But the satellite saw a far more complicated magnetic system than expected.

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## Stories of Missions Past: Explorers

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"At that point the magnetosphere was thought to be a sphere conforming to the shape of Earth," says Frank McDonald who became a Project Scientist for the Explorer Program at Goddard in 1961 and is now a professor emeritus at the University of Maryland. "We didn't know how complex a shape it was, or that there was a magnetotail flurrying out behind."

*Explorer 10* discovered this "magnetotail" as it moved through the night side of Earth, facing away from the Sun. The instruments detected an area devoid of the electrically charged solar wind steadily streaming off the Sun, since it was deflected by Earth's own magnetic field. This "shadow," the magnetotail, extends some 800,000 miles long, well past the orbit of the Moon.

As the Explorer program grew, the satellites were eventually divided into those that study the Sun-Earth system, or heliophysics, and those that study astrophysics. But in the early days this was originally considered all part of general space science. However, that was beginning to change.

The next, *Explorer 11* or *S15*, was used to search for cosmic gamma radiation, and indeed found that it came from all directions, giving birth to the field of gamma ray astronomy. The field has matured significantly over the decades and now studies such things as gamma ray bursts that originate from the distant universe, thought to be the signatures of black holes and certain supernovae.

*Explorer 12* launched in August of 1961, just over 50 years ago, but it remains a historical highlight for many a contemporary studier of space. This satellite cemented into cannon much information we know about space today. It was the first to identify Earth's "magnetopause"—the boundary between Earth's magnetic environment and interplanetary space. It also improved our understanding of the Van Allen radiation belts and Earth's magnetosphere. Notably, it helped establish that the radiation belts were not so strong that they would prevent manned spaceflight.

"We published science papers on solar activity almost every few weeks based on *Explorer 12*," says emeritus astrophysicist Thomas Cline at Goddard, whose first job at NASA focused on *Explorer 12*. "We had constant mini-discoveries. As soon as you put an instrument in space that has never been used before, you invariably observe things you've never seen before."

### . . . And Continues

From *Explorer 12* onward, many of the early Explorers had highly elliptical orbits that shot the spacecraft well outside of Earth's magnetosphere, into

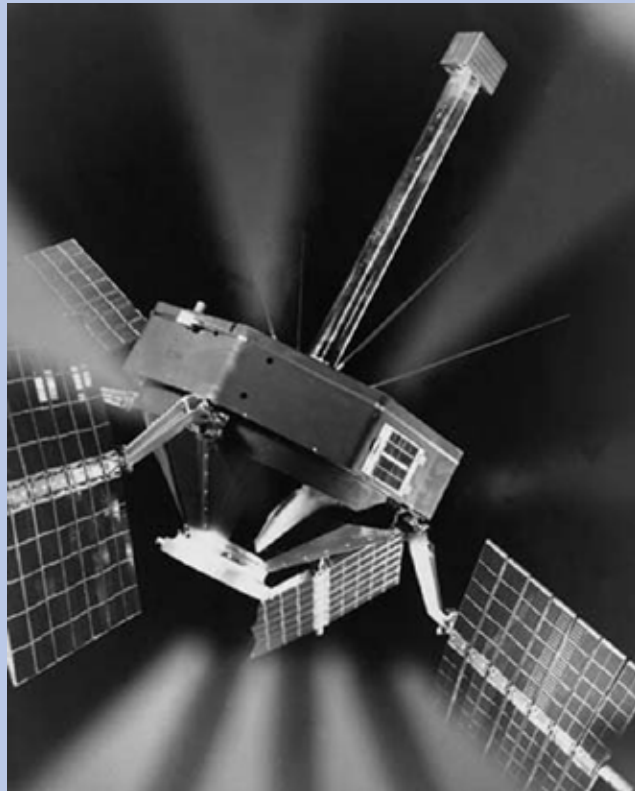


Photo credit: NASA Glenn Research Center Collection

*Caption: Explorer 12, launched into orbit on August 16 of 1961, helped develop the understanding of Earth's magnetic environment—or magnetosphere—scientists still hold today.*

interplanetary space. Scientists like Cline would use these spacecraft to expand their understanding of interplanetary space. Explorers looked at the universe in many wavelengths, brought back information about the particles in space, and mapped out the structure of the early universe.

On the heliophysics side, while those early missions simply identified the shape of Earth's magnetic environment, today's spacecraft try to spot currents in that magnetotail, to determine the shape of Earth's magnetic fields, and to see how large inputs of energy from the Sun cause space weather storms that can affect Earth.

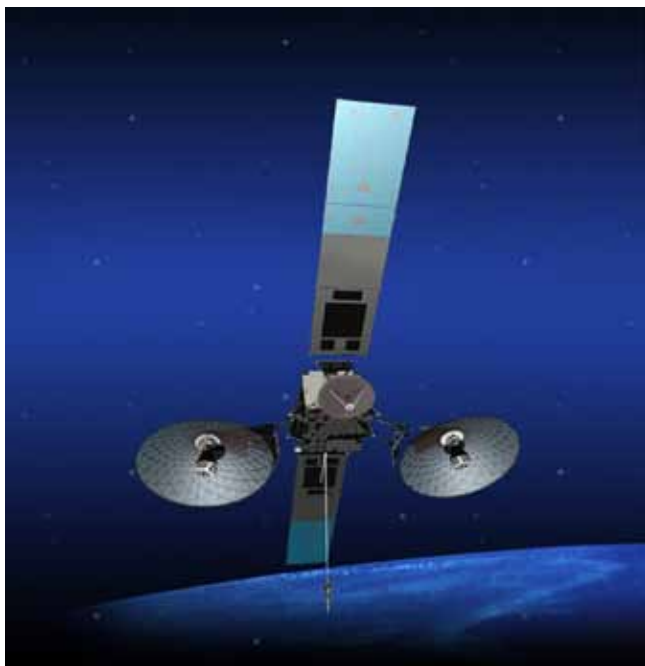
When funding is available, NASA selects new Explorers—and while the time it takes to build an Explorer is several years compared to the several months it often took in the 1950s and 1960s—the price tag still remains low and the scientific output prodigious.

The legacy of Explorer 1 goes on. ■

## All Systems Go For Next Communication Spacecraft

By Amber Hinkle and Dewayne Washington

The most recent evaluations of NASA's *Tracking and Data Relay Satellite* (TDRS) project confirmed all systems go for a third generation upgrade of the orbiting communications network. TDRS-K is scheduled for launch aboard an Atlas V rocket from Cape Canaveral, Florida in the fall of 2012.



Caption: Artist's rendition of TDRS-K.

Approval to move forward came during a recent Agency Project Management Council (APMC) meeting at NASA Headquarters. "I am very proud of the entire TDRS civil servant and contractor team for successfully completing this milestone and demonstrating that the TDRS project is ready to proceed into the integration phase," said Jeff Gramling, TDRS Project Manager. "I am excited to see the TDRS-K satellite enter the thermal vacuum chamber and begin environmental testing." Testing will occur within the Boeing Space Systems Facility in El Segundo, California.

APMC approval allows the project to enter Phase D that will include spacecraft integration and testing. During this phase, the spacecraft reflectors will be mounted and the thermal panels and batteries will be installed before the

spacecraft will have to endure the rigors of the vibration and acoustic testing. Finally, the spacecraft must pass a pre-ship review prior to being transported to Florida for launch.

Prior to the APMC approval, the project successfully completed a combined Pre-Environment Review (PER) and Systems Integration Review (SIR) in August of this year. The SIR is a significant milestone in the NASA mission lifecycle. During the upcoming environmental test phase, various segments and subsystems are scrutinized for their viability under the same harsh conditions they will endure within the vacuum of space.

"Successful completion of the environmental testing phase of the project will be the last step before we ship the TDRS-K spacecraft to the launch site," said Dave Littmann, TDRS Deputy Project Manager. "Through a rigorous testing program, we will ensure this satellite, once on-orbit, is capable of meeting its functional and performance requirements, to provide reliable services to the customers of NASA's Space Network."

This next generation space communications satellite is part of a follow-on spacecraft fleet being developed and deployed to replenish NASA's Space Network. These satellites will ensure NASA's Space Network continues to provide around-the-clock, high throughput communications services to NASA's missions and serving the scientific community and human space-flight program for years to come.

The TDRS Project Office at Goddard manages the TDRS development effort. TDRS is the responsibility of the Space Communications and Navigation (SCaN) office within the Human Exploration and Operations (HEO) Mission Directorate at NASA Headquarters. Operations of the network are the responsibility of the Space Network Project at Goddard.

In December 2007, NASA signed a contract for Boeing Space Systems to build two, third generation TDRS spacecraft for launch in 2012 and 2013. Within the contract were the required modifications that will enable the White Sands Complex ground system to support the new spacecraft.

For more information about TDRS, visit: <http://tdrs.gsfc.nasa.gov>. ■



# Goddard Warfighter Mission, Expanding Human Boundaries

By Dewayne Washington

In April 2009, Goddard embarked upon an Earth-bound mission designed to expand boundaries and facilitate the discovery of a new life. This mission, established in support of the Operation Warfighter (OWF) program, allows service members to expand employment opportunities and discover new career paths while adjusting to daily life after military service.

The Department of Defense program is designed to provide recuperating active duty service members the opportunity for a meaningful experience during their transition to a civilian career.

The NASA Goddard mission initially began as an engineering opportunity for service members interested in pursuing a career in aerospace. "It is our intent to give back on an individual basis, to those who have already made great sacrifices," said Christopher Durachka (Code 580), OWF coordinator at Goddard. "This mission also allows our Center to recruit from a dedicated, talented, diverse pool of candidates to support our space and science missions."

Durachka voluntarily researched the requirements needed to allow a service member to enter the program and made personal visits to military medical facilities. "Many were surprised to learn that they possess skills useful within the Goddard community that range from science, engineering, and professional administrative work."

Complementary to an intern program, this mission also provides service members the opportunity to build a resume, explore employment opportunities, and further develop their skills. "We strive to ensure that each service member gains a meaningful, hands-on experience in an area of interest to them," Durachka said. "We strive to introduce them to the tools, mentors, and reasonable accommodations that align with their ability and future career goals."

The Goddard Office of Communications coordinated tours of the Center to expose potential interns to the people working in the many disciplines needed for a successful mission. "Most service members are surprised to learn that you don't have to be a rocket scientist to work here," Durachka said.

There are four paths through which a service member can enter the Goddard program. Entrance into the program can be achieved by attending an OWF outreach event at the military treatment facilities in the area, by submitting a recommendation from military transition coordinators, by completing an on-line resume submission, or by completing a tour or visit at Goddard. When accepted, an internship is designed for each service member focusing on individual interests, experience level, and career goals.

Goddard's Office of Human Capital (OHCM) has also provided support to this project. Employees have assisted with resume writing and design, and

provided assistance to those wanting to explore the Goddard Cooperative Education (Co-op) Student Intern Program. Entrance into the Co-op program can provide assistance to service members interested in pursuing a college degree. Service members have also worked with mentors in Goddard's Procurement organization and the Earth Science Data Information System (ESDIS) program.

Two years after launch, this mission is realizing successes beyond expectations. "It chokes me up to see how grateful these service members are because someone reached out to help," Durachka said. "I feel they have already given so much and it is an honor for me to serve them."



*Caption: Master Sergeant Mary Moore worked at Goddard for five months supporting computer security engineers.*

The internships were originally designed to solely support Goddard's Engineering Directorate, but the military talent pool entering Goddard quickly revealed talents useful to other Directorates at the Center. Intern involvement has also included planning and logistics support, software testing, a myriad of information technology support, photography, support to Goddard Mission Control Centers, assisting network engineers to develop next generation communication networks, and more.

According to Durachka, the internship is not entirely about future employment. Often this is an opportunity to leave the hospital environment and experience work outside the military. "It is proven that placing a service member in a supportive work situation positively impacts their recuperation and transition," Durachka said. Mission success has already encouraged several Goddard contractor organizations to become key participants.

For the future, new mission objectives include increasing the Goddard mentor pool. "We would like to partner with members of the Goddard Veterans Committee to support our efforts," Durachka said. "The benefits of this mission have already been far reaching but I am hoping for more."

Durachka, an engineer, believes this mission will continue to build upon its successes similar to other NASA missions such as Voyager and the Mars Exploration Rovers. "I am hoping this effort continues a similar path of ever expanding human boundaries." ■

## An Educational ECHO, 'FIRST' Heard by NASA

By Rebecca Powell

Take five NASA employees; add a year-long leadership program, thirty enthusiastic children, homemade rockets, moon buggies, video games, and six hours on a Saturday. What is the result? A cool one-day program to inspire future generations of NASA scientists and engineers.

The NASA employees, all participants in the Agency's Foundations of Influence, Relationships, Success, and Teamwork (FIRST) leadership program, developed the Encouraging Change by Helping Others (ECHO) program as a class project.

The ECHO program, inspired by the White House Council for Women and Girls initiative, was designed to provide a day-long event with science, technology, engineering, and mathematics (STEM)-related activities in a fun environment to a group of people not previously targeted by NASA's wide-ranging educational and outreach program.

The five employees, Monica Allen, Stacey Brock-Watkins, Michelle Gordon, Rebecca Powell, and Marcello Rodriguez, sought to find the appropriate group to host for this event. Allen, Gordon, and Rodriguez all work at Goddard's Greenbelt location. Brock-Watkins comes from NASA Headquarters in Washington, D.C., and Powell works at NASA's Wallops Flight Facility, Wallops Island, Va.

Rodriguez had previously volunteered with Hope and a Home, a non-profit organization in the Washington, D.C. metro area that assists low-income families in securing transitional housing, as well as placing an emphasis on educational achievement for both the students and adults. The team decided that Hope and a Home would be a perfect fit.

"Hope and a Home's dedication to fight poverty through goodwill and extreme focus on education on all levels for both children and adults fell directly in line with our efforts to educate and reach out to an underserved sector of the community," said Rodriguez, an aerospace engineer.

The ECHO group spent several months planning every detail of the special event, which would be held at Goddard. The FIRST classmates consulted a wide variety of sources at Goddard, including the Office of Education, Office of Communication, and the Visitor Center, to develop appropriate activities to engage the students with NASA's missions.

When the time arrived to implement the months of planning, the team was ready. On a beautiful fall Saturday, nearly thirty students and their parents from Hope and a Home arrived at Goddard's Visitor Center ready for a day packed with fun.

"The kids were beyond excited to be spending a day at NASA. They were all smiles and full of questions as they anxiously waited in line to get their name tags and start the day," said Michelle Gordon, a NASA resource analyst.

The ECHO group divided the participants into age groups, ranging from three years old to adults. Each age group had customized activities that were designed to excite them about space and NASA missions. The activities included building moon buggies, designing rockets, hearing NASA employees talk about their missions, touring facilities, and even playing Moon-realted video games.

"It was an amazing day. This event helped a community of people care more deeply about our Earth and universe," said Grace Dickerson, Hope and a Home's Director of Education.



*Caption: The ECHO Team and event participants at the Goddard Visitor Center.*

"I believe the ECHO event was a success because it sparked excitement for STEM in a fun and engaging way and provided a rich and rewarding opportunity for NASA to further interact with the community in an inspirational way," said Stacey Brock-Watkins, a NASA facilities manager.

The ECHO team says they hope the participants look back on this day with excitement and remain enthusiastic about the event and what they learned. "The staff from Hope and a Home reported back to us that the excitement carried on even after the day was over. They received calls from parents saying that the kids could not stop talking about what they had learned and built that day," said Gordon.

The ECHO team plans to help arrange events like this into NASA's lineup of outreach and education collaboration. "NASA doesn't do what we do for just a small sector but to ultimately benefit everyone. There is a sector of our community that has not been afforded the opportunity to experience the great things that NASA has to offer and I believe if we have the ability to reach them, we should," said Monica Allen, a NASA contracting officer.

The ECHO team says the event was a success, but not due to any work that they've done. "The event didn't represent a single person, code, or NASA Center. They left appreciating what NASA did for them," said Allen. ■

## Practice Makes Perfect

By Rebecca Elliott

Ron Jones, a Systems Engineer for ASRC, has been at Goddard for over 20 years. Jones works on the *James Webb Space Telescope* in the ground systems and operations organization. One of his biggest life challenges, however, was not engineering feats but his fear of public speaking.

Fear of public speaking, speech anxiety, glossophobia, whatever you call it, is the number one fear reported by people in the U.S. According to Paul L. Witt, Ph.D., assistant professor of communication studies at Texas Christian University, Fort Worth, public speaking was reported scarier than rattlesnakes.

2006 was a turning point for Jones. He was asked by his NASA manager to present to an international audience of scientists, subject experts, and technologists at SpaceOps. Hosted in Rome that year, SpaceOps is a symposium for sharing and disseminating information in the field of space operations. However, his focus quickly shifted from the honor of being selected to his fear of public speaking.

Jones knew the material; he was comfortable discussing the material in a small group or amongst his peers—but not in front of an audience. Jones also realized he didn't fully participate in church events that interested him. He declined many opportunities to address the congregation and lead special groups because of his dislike of public speaking.

Two years ago, Jones decided to stop trying to work around his fear and face it head on by attending a meeting of the Goddard Toastmasters. Toastmasters International® is an international organization with roots right here at Goddard; training and supporting Goddard employees for the past 39 years. Dr. Smedly, founder of Toastmasters International, explains the program as a way to "Help people improve their communication and leadership skills in a non-threatening environment."



*Caption: Ron Jones confidently addressing a group as part of the Toastmasters Advanced Communication Series; Persuasive Speaking.*

Jones quickly realized after his first meeting that Toastmasters was the answer to his fear. Jones describes the meetings as low stress, friendly, and everyone being there for the same reason. And it isn't their fear of rattlesnakes!

Jones set goals to attend Toastmaster meetings on a regular basis and pushed to present every few weeks. He quickly realized that the more he pushed, the more comfortable he became. Also, with the support of Toastmaster members, fear no longer dominated his presentation. Rather, his focus was firmly on the subject material. After Toastmasters training and support, he routinely presents his Goddard work as an expert speaker and regularly addresses 300+ fellow church members.

Jones was inspired to become part of Toastmasters and is now an accomplished speaker and the President of the Goddard Toastmasters Club. Jones describes his fellow Toastmasters as a great team as well as his friends.

To gain freedom from your fear of public speaking, attend a Goddard Toastmasters meeting. Meetings are held every 2nd and 4th Wednesday in Building 28, Room E210. At your first meeting, you will be asked to share nothing more stressful than your name and code. You will be matched with a mentor to provide support on your journey. For additional information on the Goddard Toastmasters Chapter, visit <http://gewa.gsfc.nasa.gov/clubs/toastmasters>.

When you join the Goddard toastmasters, you are actually joining the worldwide Toastmasters organization. Created in 1924, over 4 million people around the world have become confident speakers and leaders with the help of Toastmasters International®. Currently, the organization includes approximately 270,000 members across 54 countries and 13,000 clubs.

Every year, NASA receives hundreds of requests for speakers. Audiences include students of all ages, community groups, and professional and technical organizations. Events range in size from dozens to hundreds of people that all want to know more about NASA's work and how it impact their lives. Are you an accomplished speaker that yearns to present your Goddard knowledge and gain additional speaking experience on small informal audiences or large professional peer groups? NASA employees are invited to join the NASA Goddard Speakers Bureau. Your level of expertise/experience will be honored and matched with corresponding organizations.

Volunteer today to be part of NASA's Speakers Bureau program. This opportunity costs nothing to your organization except your time. To volunteer, visit: <http://speakers.grc.nasa.gov/speaker> or contact Rebecca Elliott at: [rebecca.a.elliott@nasa.gov](mailto:rebecca.a.elliott@nasa.gov).

For additional information on Toastmasters International®, visit <http://www.toastmasters.org>. ■



## OutsideGoddard: Jen Poston

By Elizabeth M. Jarrell

Three years ago, Management Information Specialist Jen Poston joined her boyfriend on his family farm, the Old Brown Farm or the TLV Tree Farm, in Glenelg, Maryland. The farm is one of only a handful of working farms left in Howard County, Maryland and is part of the farmland preservation program; the land must always be farmed and never developed. "We live in the farmhouse that dates back to the 1800s," notes Poston. "My boyfriend's father and his father were born in this house. Until 1982, we were one of about 30 working dairy farms in Howard County. Now there are only three."

Poston's boyfriend works the farm full time with his family. Says Poston, "I help with everything. When daylight breaks, we're up and out of the house. We work until sunset." The 89 acre farm has three houses, five barns, various animals, assorted crops including pumpkins, and lots and lots of Christmas trees. The Browns also have two sheep, 15 beef cattle, 10 pigs, and 100 laying hens plus 200 broiler chickens. Unlike most farms, the Browns also have several pets including two geese, two sheep, two goats, one Black Labrador, and their mascot Karl the peacock. Says Poston, "Karl sits by the side of the road imitating the car horns. It's his entertainment and watching him is ours. Eve, our goat, was born on Christmas Eve, rejected by her mother, and joined us for Christmas Eve dinner. She is always trying to come back into the house. Our two geese are like Mother Goose and her friend."



*Caption: A view of one of the five barns during the holidays.*

"We grow tomatoes, corn, green beans, squash, lettuce, potatoes, okra, and berries, and about 800 acres of Hay and straw" says Poston. "We also raise beef, pork, lamb, and chicken, all of which are free-range, with no hormones, no antibiotics, and no genetically modified organisms." Ten acres are planted with "a lot" of pumpkins and 52 acres are planted with about 48,000 Christmas trees.

The family sells pumpkins every weekend in October. People pick their pumpkins off the vine and the cows get the leftovers. The day after Thanksgiving through the weekend before Christmas, the farm sells the trees. "We provide the saw, they provide the memory," says Poston. "People go to the field to pick and cut their own tree. People don't realize that it takes seven years for a Christmas tree to mature." She continues, "Our farm has many varieties of trees, but our best seller and our sons' favorite is the Douglas fir because of the soft needles which smell citrusy when you touch them. Our second best seller and my favorite is the Fraser fir because of its long needle retention and strong branches." They sell close to 2,000 trees every season. Their biggest competition is not other tree farms, but the fake trees. Notes Poston, "You can plant our trees after Christmas and continue the memories."

Unlike the movies, there have never been any arguments among customers over the trees. "We have so many to choose from," says Poston. "And Santa is watching on weekends so no one really wants to fight in front of him." Santa, a family friend, used to sit in a sleigh pulled by donkeys dressed with reindeer antlers. "We never could get Rudolph's red nose to stay on," notes Poston. Now he sits in an antique sled indoors and poses for pictures with children.

The family replants about 4,000, twelve-inch seedlings every spring. "If we need to water, we will, but Mother Nature usually takes care of us," says Poston. "Our biggest problem is the deer that eat or knock branches off of about 25% of our seedlings. There is nothing we can do." Most of the tree care involves weeding, protecting and trimming. "If the soil has the right nutrients, you don't need any fertilizer," notes Poston. "We also participate in 'Trees for Troops,' which sends Christmas trees to military families," says Poston. "We think it is important to support our troops."

Explains Poston, "I love farming. I use my brain at work, but at home I enjoy working with my hands outside in the fresh air." The family's food comes from the farm as much as possible. "My favorites are the maple sausage, lettuce, and strawberries," she says. "I never thought I'd end up a farmer's wife, but I wouldn't have it any other way. We think both of our boys will also grow up to be farmers on the family farm too." ■

Photo provided by Jen Poston